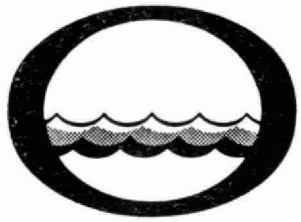
1971 OPERATING SUMMARY

FORT FRANCES

WATER POLLUTION CONTROL PLANT



Water management in Ontario

Ontario
Water Resources
Commission

We are pleased to submit for your consideration a summary of operation during 1971 of the water pollution control plant serving your community.

This operating summary contains parameters normally used to measure plant performance and loading, as well as relevant cost data. Because of the concern over eutrophication of our lakes and of the requirement, in many parts of Ontario, to remove the major contributing factor, results of analysis for phosphorus appear in this summary.

D. S. Caverly,
General Manager.

D. A. McTavish, P. Eng.,
Director,
Division of Plant Operations.

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FORT FRANCES

WATER POLLUTION CONTROL PLANT

operated for

THE TOWN OF FORT FRANCES

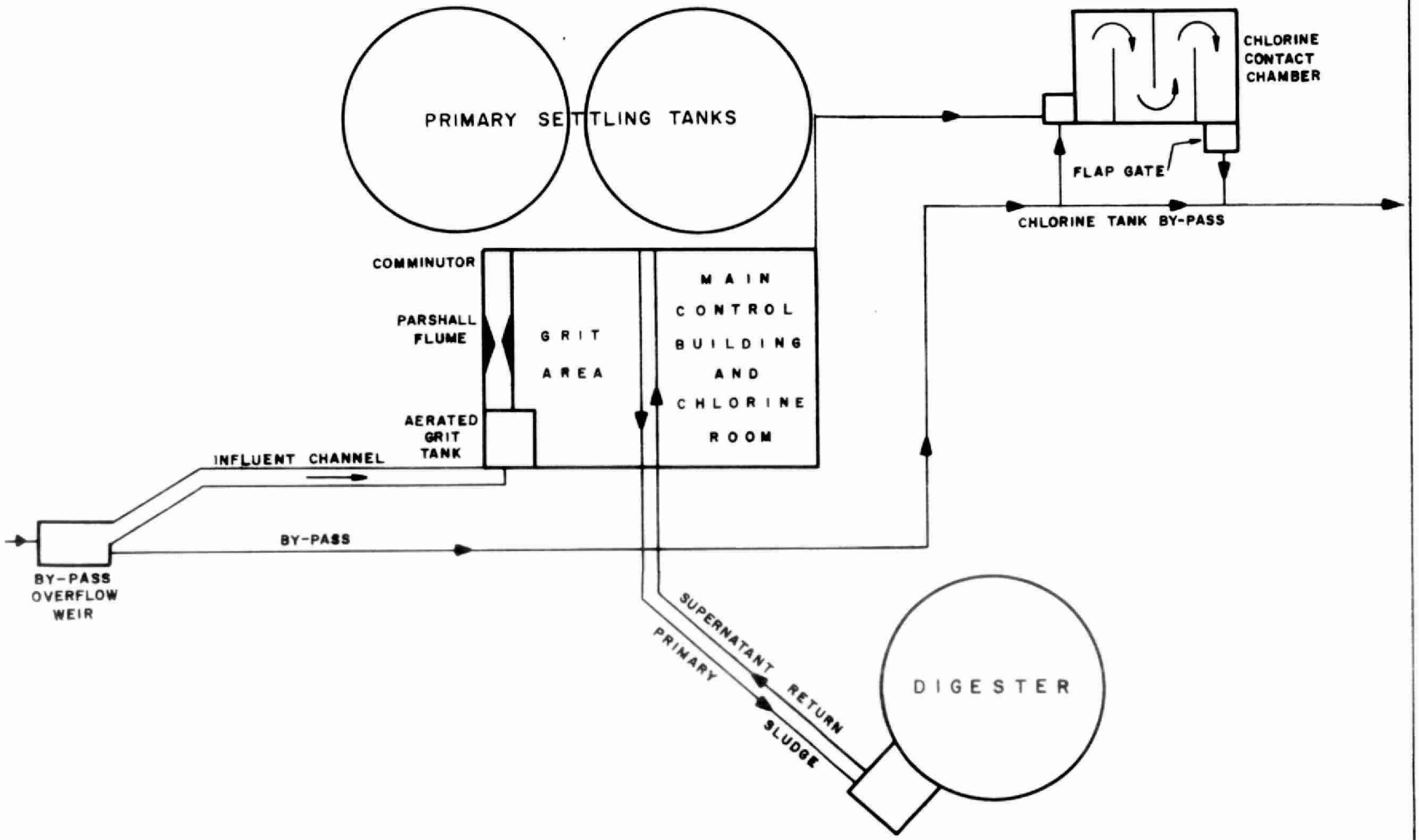
by the

ONTARIO WATER RESOURCES COMMISSION

1971 ANNUAL OPERATING SUMMARY

CONTENTS

FORT FRANCES W P C P
FLOW CHART



DESIGN DATA

PROJECT NO.	2-0060-59
TREATMENT	Primary
DESIGN FLOW	2.0 mgd
DESIGN POPULATION	12,000
BOD - Raw Sewage	130 mg/l
- Removal	40%
SS - Raw Sewage	180 mg/l
- Removal	60%

PRIMARY TREATMENT

Screening

- Coarse bar screen (2")

Comminution

Type: Smith & Loveless Model 15R

Grit Removal

Type: Aerated; grit removed by clamshell bucket
Size: One 10' 5" x 10' 5" x 13' 9" swd (1515 cu ft or 9,400 gal)
Retention: 6.8 min

Air Supply

Type: Roots-Connersville
Size: One 100 scfm @ 9 psi

Primary Sedimentation

Type: Eimco Process
Size: Two 40' x 40' x 10' swd (32,000 cu ft or 200,000 gal)
Retention: 2.4 hours
Loading: Surface, 625 gal/ft^2/day
Weir, 9,660 gal/ft/day

CHLORINATION

Type: W & T Model A-731
Size: 400 lb/day

Chlorine Contact Chamber

Size: 27' x 20' x 8.5' (avg) (4,590 cu ft or 28,600 gal)
Retention: 20.6 min

OUTFALL

- to Rainy River

SLUDGE HANDLING

Digestion System

Type: Single stage with floating cover; gas mixed
Size: One 40' dia x 25' swd (31,500 cu ft or 195,500 gal)
Loading: 1.38 lb/cu ft/mo
Mixer: Roots-Connersville Type XA

'71 Review

GENERAL

The treatment plant, two OWRC pumping stations and three municipal pumping stations are operated by the chief operator and two operators.

EXPENDITURES

A total of $51,118.62 was spent which represents $72.10 per million gallons treated and 21.4 cents per pound of BOD removed.

PLANT FLOWS and CHLORINATION

A total of 714.6 million gallons was received in 1971. The average daily flow was 2.0 million gallons. The daily flow exceeded the design flow approximately 35 percent of the time. It should be noted that on a yearly basis over the past six years, the flows have remained somewhat constant. Chlorine was applied from March to December at an average dosage of 3.3 mg/l. A total of 18,900 pounds of chlorine was used during this period.

PLANT EFFICIENCY

The raw BOD concentration averaged 83 mg/l which was reduced 41 percent to an effluent BOD concentration of 49 mg/l. The average raw suspended solids concentration was 127 mg/l which was reduced to 64 mg/l, a reduction of 50 percent. A total of 1088 cubic feet of grit was removed in 1971.

SLUDGE DIGESTION and DISPOSAL

The digester was cleaned out from June 10 to August 20. A total of 562, 700 gallons was pumped to the digester at an average total solids concentration of 3. 1 percent. Including cleanout, 767, 800 gallons were removed at an average total solids concentration of 4. 7 percent. The volatile solids reduction was from 61 to 48 percent.

CONCLUSIONS

Flows increased slightly in 1971 however, sewage strength remained essentially the same. Plant efficiencies dropped somewhat, possibly due to repairs undertaken on one of the primary clarifiers for a period of approximately four weeks and hydraulic overload which occurred 35 percent of the time.

RECOMMENDATIONS

It is recommended that the municipality continue in its efforts to reduce infiltration in the sewage collection system. If the municipality is planning extensive development without reducing infiltration, then plans for a plant expansion should be initiated.

PROJECT COSTS

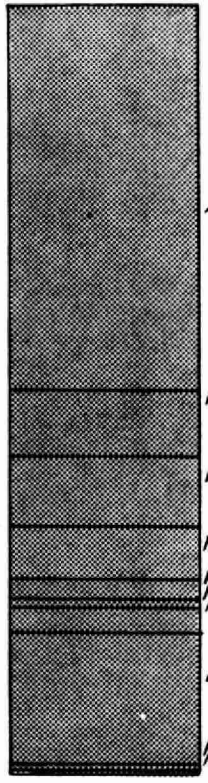
NET CAPITAL COST (Final)	$1,894,347.61
DEDUCT - Portion financed by CMHC/MDLB (Final)	1,276,239.07
Long Term Debt to OWRC	$ 618,108.54
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1971	$ 117,312.99
Net Operating	$ 51,518.62
Debt Retirement	6,383.00
Reserve	8,436.87
Interest Charged	34,670.22
TOTAL	$ 101,008.71

RESERVE ACCOUNT

Balance @ January 1, 1971	$ 84,069.61
Deposited by Municipality	8,436.87
Interest Earned	5,641.37
	$ 98,147.85
Less Expenditures	-
Balance @ December 31, 1971	$ 98,147.85

1971 COSTS

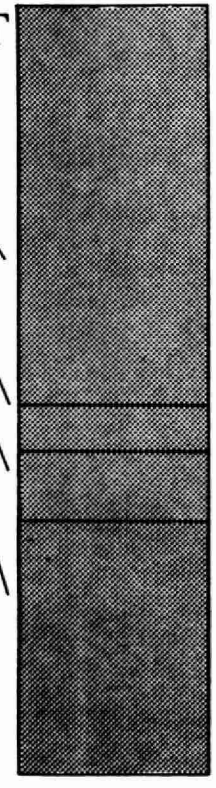
OPERATING COSTS



PAYROLL	50 %
FUEL	8 %
POWER	9 %
CHEMICALS	7 %
GENERAL SUPPLIES	3 %
EQUIPMENT	< 1 %
REPAIRS & MAINTENANCE	3 %
SUNDRY	18 %
WATER	1 %
TRAVEL	< 1 %

TOTAL ANNUAL COST

NET OPERATING	51 %
DEBT RETIREMENT	6 %
RESERVE	9 %
INTEREST	34 %



YEARLY OPERATING COSTS

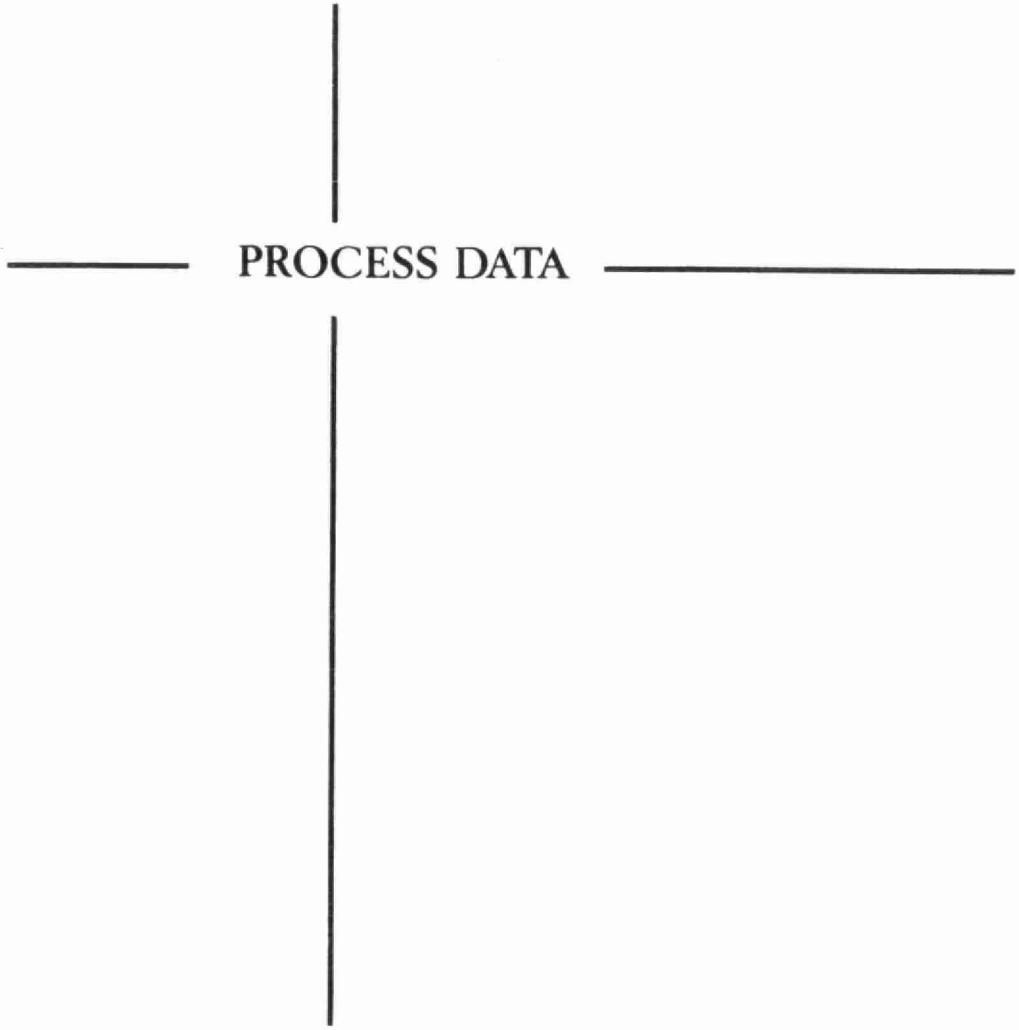
YEAR	SEWAGE TREATED in million gallons	TOTAL OPERATING COSTS	TREATMENT COSTS	
			$ per million gal	¢ per lb BOD
1967	691.262	$35,624.59	$51.54	13 cents
1968	736.200	36,705.23	39.86	11 cents
1969	692.810	38,741.52	55.92	13 cents
1970	686.4	44,640.95	65.04	14 cents
1971	714.6	51,518.62	72.10	21 cents

MONTHLY OPERATING COSTS

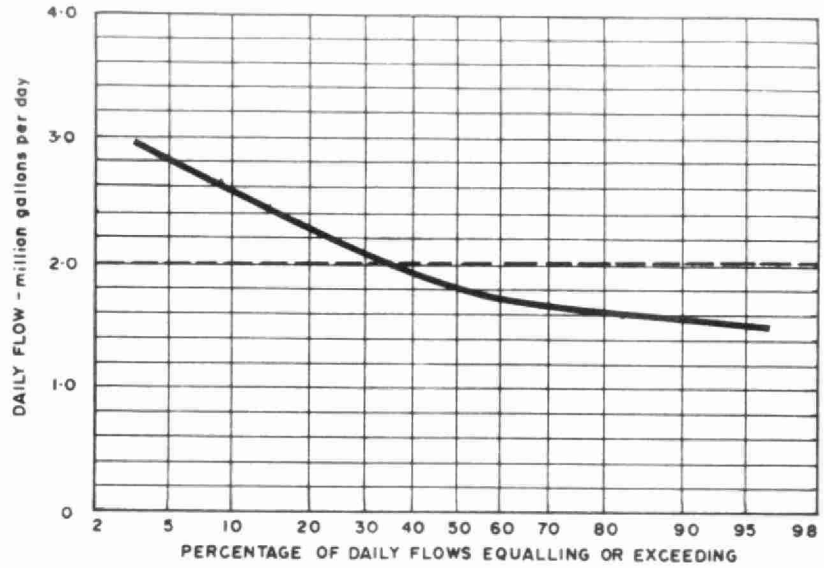
MONTH	TOTAL EXPENDITURE	REGULAR PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICALS	GENERAL SUPPLIES	EQUIPMENT	REPAIRS and MAINTENANCE	SUNDRY*	WATER	TRAVEL
JAN	2355.84	1853.19	-	-	165.73	-	34.52	-	-	302.40	-	-
FEB	4747.83	2711.89	-	1265.98	495.73	-	55.26	-	(11.63)	191.60	39.00	-
MAR	4014.17	1813.93	-	479.29	399.50	89.54	168.24	-	542.44	482.23	39.00	-
APR	3445.25	1836.33	-	-	447.12	447.70	64.18	-	242.03	368.89	39.00	-
MAY	3526.21	1849.96	184.10	419.56	450.52	437.63	133.21	-	-	12.23	39.00	-
JUNE	3224.53	1708.38	(184.10)	517.87	616.25	-	190.50	101.77	-	201.86	-	-
JULY	2758.16	1118.61	122.50	247.79	196.34	437.63	207.95	-	282.45	108.89	36.00	-
AUG	4706.37	1948.04	196.90	-	399.98	-	46.08	-	123.83	1951.00	40.54	-
SEPT	8668.27	1987.46	121.04	-	315.41	291.75	157.30	41.58	-	5709.47	44.26	-
OCT	4087.67	2806.18	-	138.19	375.19	583.51	102.00	-	22.22	24.38	36.00	-
NOV	4233.46	2662.49	-	440.37	344.57	331.03	177.82	-	32.97	45.32	36.00	162.89
DEC	5750.86	2940.70	-	423.75	553.55	875.26	415.64	-	372.71	95.63	73.62	-
TOTAL	51518.62	25309.16	440.44	3932.80	4759.89	3494.05	1752.70	143.35	1607.02	9493.90	422.42	162.89

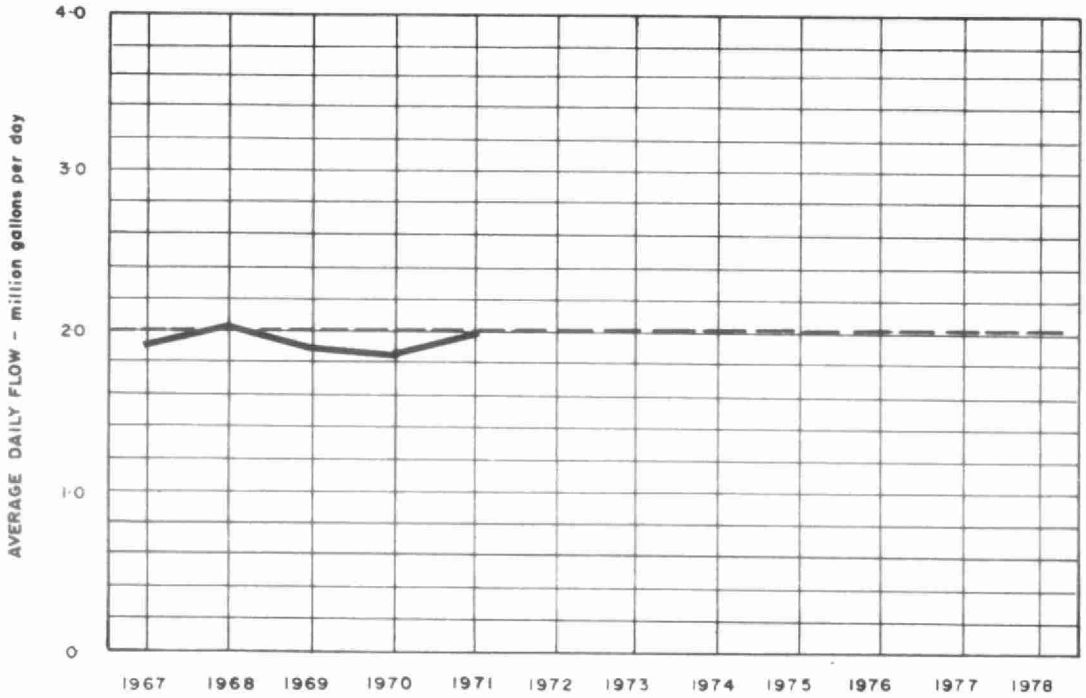
Brackets indicate credit.

* Sundry includes sludge haulage costs of $7,396.80


PROCESS DATA

FLOWS



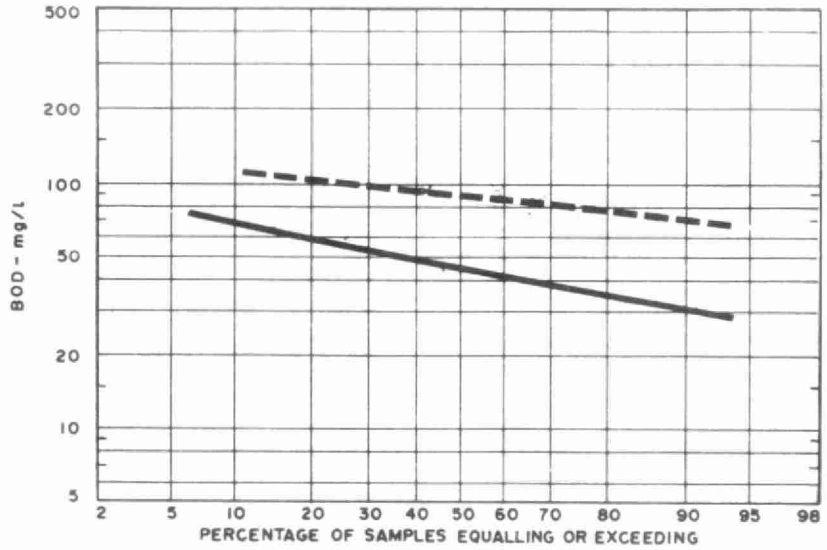


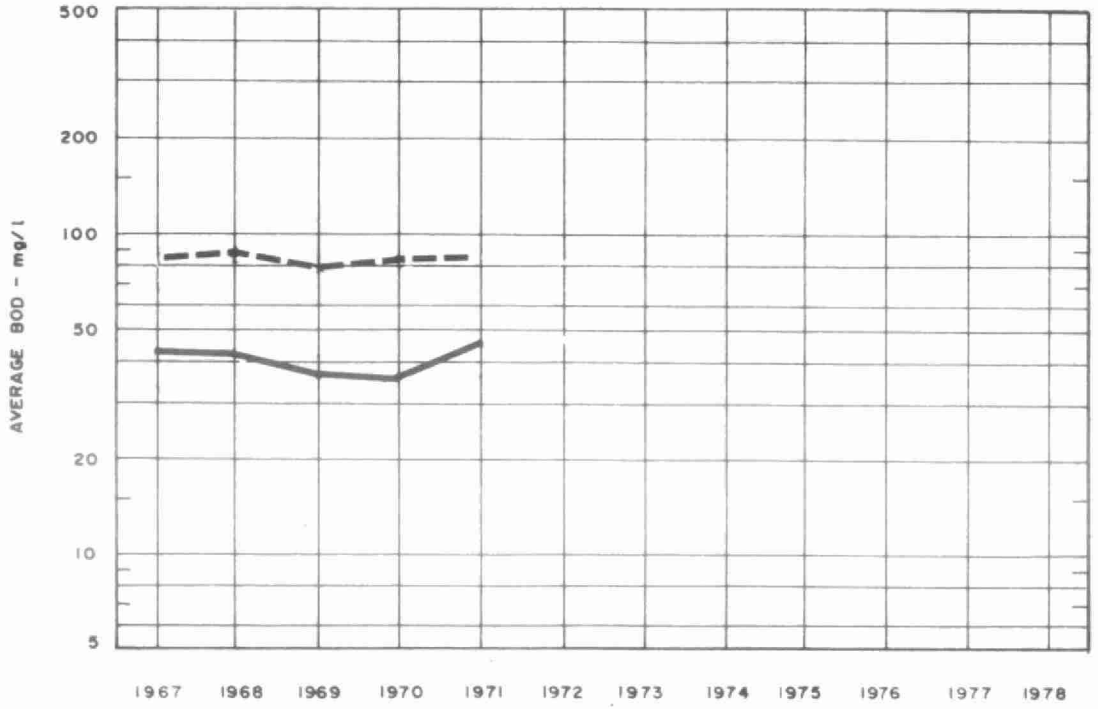
DESIGN CAPACITY _ _ _ _ _ _ _

PLANT PERFORMANCE

MONTH	FLOWS				BIOCHEMICAL OXYGEN DEMAND				SUSPENDED SOLIDS				TOTAL PHOSPHORUS		
	TOTAL FLOW	AVERAGE DAY	MAXIMUM DAY	MAXIMUM RATE	INFLUENT	EFFLUENT	REDUCTION		INFLUENT	EFFLUENT	REDUCTION		INFLUENT	EFFLUENT	REDN
	million gallons	mil gal	mil gal	mgd	mg/l	mg/l	%	10^3 pounds	mg/l	mg/l	%	10^3 pounds	mg/l as P	mg/l as P	%
JAN	51.7	1.7	2.1	2.6	66	32	52	17.6	121	61	50	31.0	-	-	-
FEB	50.5	1.8	2.3	3.3	73	33	55	20.2	146	67	54	39.9	-	-	-
MAR	53.6	1.7	2.4	3.5	80	38	53	22.5	124	63	49	32.7	-	-	-
APR	67.9	2.3	2.8	4.0	87	53	39	23.1	176	84	52	62.5	-	-	-
MAY	69.6	2.3	3.5	4.9	88	48	46	27.9	124	68	45	39.0	-	-	-
JUNE	59.3	2.0	2.4	4.9	82	64	23	10.7	136	69	49	39.7	-	9	-
JULY	59.0	1.9	2.4	6.0	66	31	53	20.7	85	50	41	20.7	6	4	33
AUG	49.9	1.6	1.8	3.7	69	39	44	15.0	110	60	45	24.9	6	3	50
SEPT	45.6	1.5	2.3	5.1	109	72	34	16.9	155	74	52	37.0	6	4	33
OCT	68.6	2.2	4.3	6.0	91	52	43	26.8	119	65	45	37.1	-	-	-
NOV	79.8	2.7	3.2	4.5	86	58	33	22.4	115	52	55	50.3	4	3	25
DEC	59.1	1.9	2.2	2.6	86	58	33	16.6	88	50	43	22.5	3	3	-
TOTAL	714.6	-	-	-	-	-	-	240.4	-	-	-	437.3	-	-	-
AVG.	-	2.0	MAXIMUM 4.3	MAXIMUM 6.0	83	49	41	20.0	127	64	50	36.4	5	4	35
No. of Samples	-	-	-	-	49	49	-	-	56	56	-	-	9	10	-

BIOCHEMICAL OXYGEN DEMAND

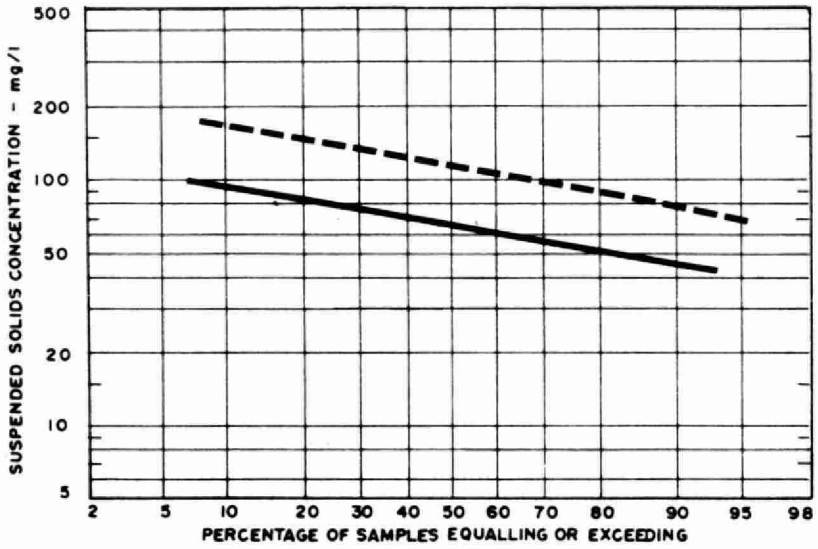


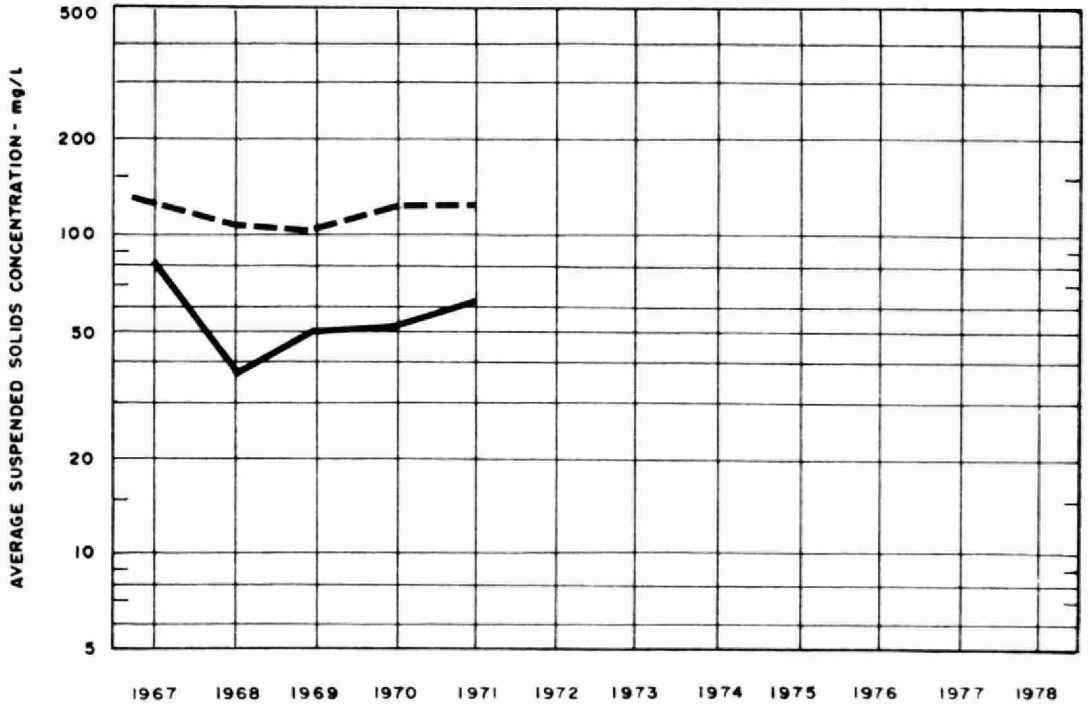


PLANT INFLUENT

PLANT EFFLUENT

SUSPENDED SOLIDS





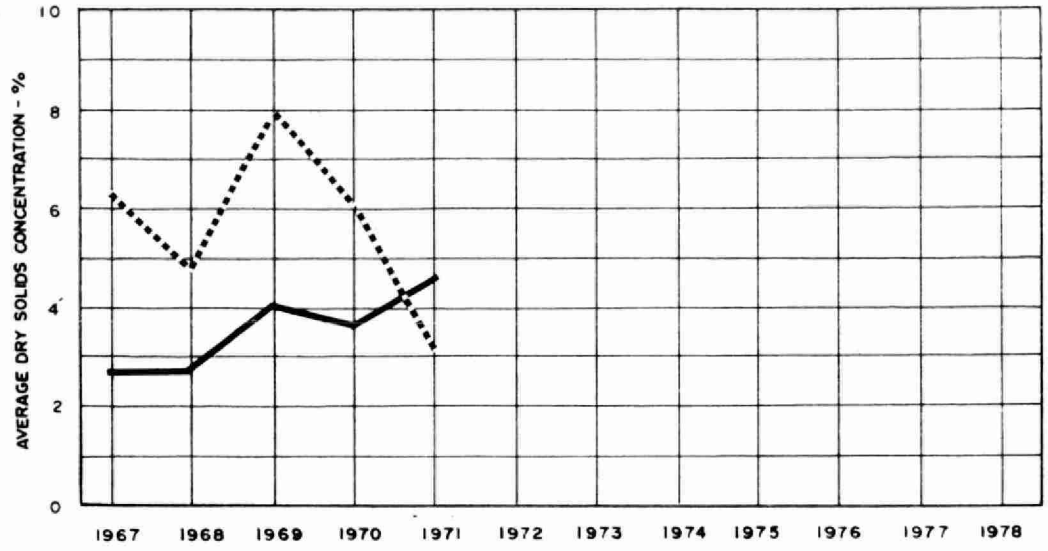
PLANT INFLUENT

PLANT EFFLUENT

TREATMENT DATA

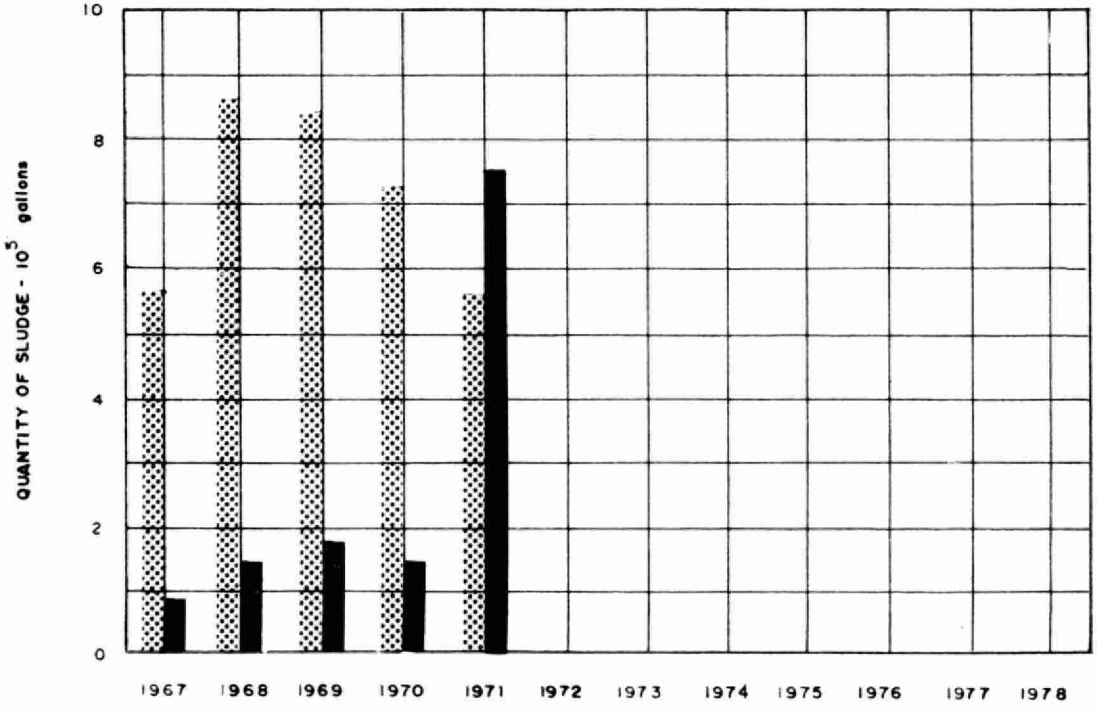
	GRIT	CHLORINATION		SLUDGE DIGESTION and DISPOSAL							
				RAW SLUDGE			DIGESTED SLUDGE			SUPERNATANT	
MONTH	QUANTITY REMOVED cubic feet	CHLORINE USED 10^3 pounds	AVERAGE DOSAGE mg/l	QUANTITY 10^3 gallons	TOTAL SOLIDS %	VOLATILE SOLIDS %	QUANTITY REMOVED 10^3 gallons	TOTAL SOLIDS %	VOLATILE SOLIDS %	TOTAL SOLIDS %	SLUDGE HAULED cubic yards
JAN	7	-	-	84.6	2.2	67	7.0	3.5	66	.1	42
FEB	2	-	-	68.3	3.3	62	25.0	6.5	51	.1	150
MAR	16	.62	3.4	75.0	2.7	61	14.0	5.5	37	.9	84
APR	34	2.04	3.0	86.8	3.5	62	8.0	5.8	46	.2	48
MAY	32	1.72	2.5	39.4	2.5	67	25.1	6.6	43	.2	150
JUNE	120	1.80	3.0	3.6	3.0	68	176.9	4.0	49	-	1050
JULY	255	1.63	2.8	-	-	-	329.5	-	-	-	1956
AUG	387	1.81	3.6	-	-	-	179.3	-	-	-	1064
SEPT	16	1.95	4.3	36.2	3.5	65	0	-	-	.1	0
OCT	25	2.39	3.5	33.1	3.7	54	1.0	-	-	.2	6
NOV	169	2.64	3.3	67.5	4.4	45	0	-	-	.1	0
DEC	25	2.30	3.9	68.2	2.5	61	2.0	.8	47	.1	12
TOTAL	1088	18.90	—	562.7	—	—	767.8	—	—	—	4562
AVG.	1.5 cubic feet/mil gal	1.89	3.3	56.3	3.1	61	76.8	4.7	48	.2	456

DIGESTION



RAW SLUDGE .....

DIGESTED SLUDGE ——



RAW SLUDGE TO DIGESTER

DIGESTED SLUDGE REMOVED